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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,512	07/24/2003	Yoshifumi Inoue	240627US0	9013

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ALEXANDRIA, VA 22314

EXAMINER

ROBERTSON, JEFFREY

ART UNIT	PAPER NUMBER
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1712

DATE MAILED: 09/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/625,512

Applicant(s)

INOUE, YOSHIFUMI

Examiner

Jeffrey B. Robertson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 July 2005.
2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-37 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 19-37 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 19-22, 25, 26, and 31-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kagoshima et al. (U.S. Patent No. 5,274,006) in view of Starkey (US 2003/0001140 A1).

For claims 19, 25, 26, and 36, Kagoshima teaches a composition that contains an epoxy resin having at least two epoxy groups within the molecule, foaming agent with a decomposition temperature between 100-220° C, and a curing agent. Col. 2, lines 45-53. For claim 20, Kagoshima teaches epoxy resins such as bisphenol A epoxy resins. Col. 2, line 64 through col. 3, line 6. Note that none of these epoxy resins are halogenated.

For claims 21, 33 and 34, Kagoshima teaches aromatic amines including phenylene diamine and phenols such as tris(dimethylaminomethyl)phenol are used as curing agents where the curing agent is added in an amount of 0.5-20 parts by weight. Col. 3, lines 14-41.

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For claim 31, Kagoshima does not expressly teach the amount of gas generated from the foaming agent or the decomposition temperature. However, this appears to be an inherent property of the foaming agent used.

For claim 32, Kagoshima discloses foaming agents such as azodicarbonamide. Col. 4, lines 4-7.

For claim 35, Kagoshima teaches the addition of filler. Col. 6, lines 23-28.

In column 11, lines 9-10, Kagoshima teaches that the compositions are useful are packaging materials. Kagoshima fails to expressly teach the process for producing a resin encapsulated semiconductor device as set forth in present claims 19 and 36.

For claims 19, 36, and 37, Starkey teaches that epoxy resin compositions are widely used for packaging materials, especially as encapsulants for semiconductor elements. Paragraph [0004].

Starkey teaches that the epoxy resins are molded on semiconductor devices and cured. Paragraph [0042].

Kagoshima and Starkey are analogous are in that they both teach epoxy compositions as packaging materials. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the compositions of Kagoshima as encapsulants for semiconductors as in the method set forth by Starkey. The motivation would have been that Kagoshima teaches that the epoxy compositions set forth in the patent are suitable for packaging materials. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

3. Claims 19-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lamon et al. (U.S. Patent No. 5,453,453) in view of Czaplicki et al. (U.S. Patent No. 6,846,559), Jannic (U.S. Patent No. 5,019,605), and Starkey (US 2003/0001140 A1).

For claims 19 and 36, Lamon teaches halogen-free compositions that contain an epoxy resin, foaming agent, and a curing agent. Col. 2, lines 10-19. For claim 20, Lamon teaches epoxy resins such as bisphenol A epoxy resins having at least two epoxy groups within the molecule. Col. 3, lines 23-54.

For claims 21, 33 and 34, Lamon teaches aromatic amines and phenols are used as curing agents where the curing agent is added in an amount of 0.5-30 parts by weight. Col. 4, lines 5-22.

For claim 27, Lamon teaches sodium borohydride foaming agents, which has a decomposition melting point of 400 degrees. Col. 5, line 15.

For claim 32, Lamon discloses foaming agents such as azodicarbonamide. Col. 5, lines 4-18. For claims 25-31, Lamon does not expressly teach the amount of gas generated from the foaming agent or the decomposition temperature. However, this appears to be an inherent property of the foaming agent used.

For claim 35, Lamon teaches the addition of filler. Col. 6, lines 5-7.

Lamon fails to expressly teach the phenolic resin curing agents set forth in the claims as well as the process of forming a resin-encapsulated semiconductor device.

Czaplicki teaches compositions that contain an epoxy resin, foaming agent, filler, and a curing agent. For claims 21-24, 33 and 34, Czaplicki teaches phenol novolak resins used as curing agents. Col. 4, lines 25-42.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the phenol curing agents of Czaplicki in the compositions of Lamon. The motivation would have been that Lamon teaches the genus of phenol curing agents. One of ordinary skill in the art would have turned to Czaplicki for particular phenol curing agents useful in similar epoxy compositions.

Lamon teaches that the compositions are used in the aerospace industry and specifically references the Jannic patent in col. 1, lines 5-31. The Jannic patent teaches that epoxy compositions used in the aerospace industry includes using the compositions as encapsulating compounds. Col. 1, lines 10-5 and 40-51.

For claims 19, 36, and 37, Starkey teaches that epoxy resin compositions are widely used as encapsulants for semiconductor elements. Paragraph [0004].

Starkey teaches that the epoxy resins are molded on semiconductor devices and cured. Paragraph [0042].

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the compositions of Lamon as encapsulants for semiconductors as in the method set forth by Starkey. The motivation would have been that Lamon teaches that the epoxy compositions set forth in the patent are suitable for aerospace applications and Jannic teaches that this includes encapsulating compounds. The selection of a known material based on its suitability for its intended use supported a

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prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Response to Arguments

4. Applicant's arguments filed 7/19/05 have been fully considered but they are not persuasive. Regarding the Kagoshima and Lamon references, applicant argues that the references do not teach or suggest the method of encapsulating the semiconductor devices now claimed. The examiner disagrees in view of the rejections set forth above. Therefore, applicant's arguments are not persuasive.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey B. Robertson whose telephone number is (571) 272-1092. The examiner can normally be reached on Mon-Fri 7:00-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jeffrey B. Robertson
Primary Examiner
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JBR